PHYS 201 Conservation of Momentum Wiley Plus: 21, 31, 32, 39, 41, 62

1. Define momentum and identify it as a vector or scalar.

2. State the law of conservation of momentum.

3. (P32) A car is traveling at when it collides head-on with a sport utility vehicle traveling in the opposite direction. In the collision, the two vehicles come to a halt. At what speed was the sport utility vehicle traveling?

4. (P41) A 50.0-kg skater is traveling due east at a speed of 3.00 m/s. A 70.0-kg skater is moving due south at a speed of 7.00 m/s. They collide and hold on to each other after the collision, managing to move off at an angle θ south of east, with a speed of *v*f. Find
(a) the angle θ and (b) the speed **v**f, assuming that friction can be ignored.

5. (P39) A girl is skipping stones across a lake. One of the stones accidentally ricochets off a toy boat that is initially at rest in the water (see the drawing). The 0.072-kg stone strikes the boat at a velocity of , below due east, and ricochets off at a velocity of , above due east. After being struck by the stone, the boat's velocity is , due east. What is the mass of the boat? Assume the water offers no resistance to the boat's motion.

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